



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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MINERALS PROGRAM
FILE COPY

October 9, 1991

Mr. Max J. Reynolds
Vice President Operations
Great Salt Lake Minerals
765 North 10500 West
Ogden, Utah 84402

Dear Mr. Reynolds:

Re: Final Approval, Little Mountain Plant, M/057/002, Great Salt Lake Minerals and Chemicals Corporation, Weber County, Utah

The Board of Oil Gas and Mining approved Great Salt Lake Minerals and Chemical Corporation's form and amount of surety (as amended) for the Little Mountain Plant on October 4, 1991.

Enclosed is a copy of the original signed and approved Reclamation Contract and the package that went before the Board for approval.

The surety for Great Salt Lake Minerals, Little Mountain Plant, is to be evaluated and updated on an annual basis until 1994. The surety approved by the Division for \$228,000 in 1991 dollars will have to be evaluated and updated August 31, 1992.

Thank you for your time and support in this permitting process. We look forward to working with you in the future in keeping this permit and surety current.

Sincerely,

Anthony A. Gallegos
Reclamation Engineer

jb
Enclosure
M057002.1

EXECUTIVE SUMMARY

Prepared September 16, 1991

Mine Name: <u>Little Mountain Mine</u>	I.D. No: <u>M/057/002</u>
Operator: <u>Great Salt Lake Minerals</u>	County: <u>Weber</u>
<u>and Chemical Corporation</u>	New/Existing: <u>Existing</u>
<u>765 North 10500 West</u>	Mineral Ownership: <u>State of Utah</u>
<u>Ogden, Utah 84402</u>	Surface Ownership: <u>St. of Utah, GSLM</u>
Telephone: <u>(801) 521-3556</u>	Lease No.(s): <u>ML 25384, ML 25859,</u>
	<u>ML 19024, ML 19059, ML 21708, ML</u>
	<u>22782, ML 23023, ML 24184, ML</u>
	<u>24631, R-W 1073</u>
Contact Person: <u>Max Reynolds</u>	Permit Term: <u>Life of Mine</u>

Life of Mine: 200 Years

Legal Description: Portions of Section 5, T6N, R9W; Section 31, R7N, R9W; Sections 16, 17, 21, 22, 26, 35, and 36, T7N, R10W

Mineral(s) to be Mined: Potassium sulfate (Potash), Sodium sulfate, Sodium chloride (Salt), and Magnesium chloride (Dust suppressant).

Mining Methods: Solar evaporation

Acres to be Disturbed: Plant site, 500 acres; Evaporation ponds, 51,000 acres; (current 17,500 + 17,000 (new); Borrow areas/pits, 115 acres

Present Land Use: Mining and minerals processing.

Postmining Land Use: Recreation or waterfowl refuge (lake) and industrial (plant site).

Variances from Reclamation Standards (Rule R613) Granted: R613-004-111 (5) Land Use; R613-004-111 (7) Highwalls; R613-004-111 (9) Impoundments; and R613-004-111 (12) Soils, R613-004-111 (13) Revegetation.

Soils and Geology:

Soil Description: Clay soils are used in dike construction.

Ph: N/A

Special Handling Problems: Although the borrow pits do not have topsoil available for reclamation, the clay fines will be used to aid plant growth.

Geology Description: The evaporation ponds are built on mud flats on the Great Salt Lake.

Hydrology:

Ground Water Description: N/A

Surface Water Description: The Bear River Bay and Willard Bay are isolated from the solar ponds.

Water Monitoring Plan: N/A

Ecology:

Vegetation Type(s); Dominant Species: Alkali sacaton, sagebrush, rabbitbrush and saltbrush.

Percent Surrounding Vegetative Cover: 30%

Wildlife Concerns: None

Surface Facilities: The 500 acre plant site is located in an industrial park with a Southern Pacific rail spur.

Mining and Reclamation Plan Summary:

During Operations:

1. Great Salt Lake Minerals and Chemicals Corporation (GSLM) pumps brine from the north arm of the Great Salt Lake at the southwest corner of Promontory Peninsula through a system of existing solar evaporation ponds. As the brines flow through the pond system, water evaporates and minerals precipitate on pond floors.
2. After the evaporation process is finished, minerals are harvested and trucked to GSLM's plant site on Little Mountain for processing.
3. Borrow material is excavated from borrow pits located on fee land at Little Mountain, Promontory and Strong's Knob.
4. As part of the lease agreement with the State, all unused minerals in the pond system or in the plant effluent are returned to the lake.

5. GSLM leases 89,000 acres of lands from the State of Utah. Currently, ponds cover 17,500 acres, with an expansion up to 34,000 acres planned and already permitted by various state and federal agencies through the Army Corps of Engineers. Projected mine life is 200 years.

After Operations:

1. After cessation of operations, GSLM will negotiate a transfer of the pond system to the State of Utah for wildlife management, as per requirements of state leases. Any structures and equipment not suitable for these purposes will be removed. Roads and dikes will remain in place.
2. If the area is not accepted for wildlife management, all structures and equipment will be removed. Dikes will be breached to allow water to circulate and clean out the ponds. The removal of these structures and equipment and the breachment of the dikes is included in the reclamation estimate. Wave action will eventually wash out and level non-maintained dikes and roads.
3. The 500 acre plant site and structures on Little Mountain are part of a zoned and regulated industrial park and are marketable as such for continued use. The surety includes removal of trash and debris only. Unmarketable structures will be removed for scrap value. The area will not be returned to its original conditions.
4. Borrow pits will be recontoured to match the surrounding areas and to provide for drainage of water. A single highwall on pit No. 5 will remain at a 70° slope. The areas will then be roughened and seeded with the following species which are adapted to the site:

Alkali Sacaton	1 lb/acre
Westair Wheatgrass	4 lb/acre
Basin Wildrye	4 lb/acre
Yellow Sweetclover	2 lb/acre
Big Sagebrush	<u>1 lb/acre</u>
	12 lb/acre

No topsoil will be available for reclamation and the soil may need to be amended to support plant growth. These soil amendments are included in the surety.

Surety:

Amount: \$228,000 (1991 \$)

Form: Letter of Credit

Renewable Term: Annual until 1994

RECLAMATION ESTIMATE

Great Salt Lake Minerals & Chemicals Corporation

West Shore Dike & Underwater Channel Project – AMENDMENT

Weber County M/057/002 last revision 8/29/91

Prepared by Utah State Division of Oil, Gas & Mining

Reclamation Details

- These details are for reclamation of the amendment features only
- Unit costs are from the 1989 DOGM estimate plus actual escalation
- ASSUMED: 20 acres of disturbance at 57 acre borrow area on Strongs Knob
- ASSUMED: All quarry slopes at 45 degrees or less in borrow area
- ASSUMED: No regrading or revegetation activities at the borrow area
- New dike approximately 8.5 miles long(Strong's Knob to Fingerprint)
- ASSUMED: A breach in the dike every mile
- New pond area of approximately 17,000 acres; NO RECLAMATION
- New pumping station at Finger Point; ASSUME all structures removed
- Access road portion across lake bed, approx. 1 1/4 miles; total road 3 miles
- Road on State Lands easement; ASSUME breach in lake bed every 1/2 mile
- 20 miles of underwater channel in the Great Salt Lake: NO RECLAMATION
- Reclamation estimate to be calculated in 1991 dollars
- This amount to be added to the 1991 surety update for the entire operation
- Surety to be renewed annually until the 5-year review date in 1994

<u>Description</u>	<u># Units</u>	<u>\$/Unit</u>	<u>Cost(\$)</u>
Breaching dike	8 each	1,247	9,976
Removal of pump station facilities	1 sum	20,000	20,000
Breaching access road	2 each	1,247	2,494
Mobilization	1	2,000	2,000
SUBTOTAL			34,470
+ 10% CONTINGENCY			3,447
AMENDMENT TOTAL 1991 – \$			37,917
ENTIRE OPERATION RECLAMATION SURETY IN 1990 – \$			186,500
ESCALATED USING 1.93% TO 1991 VALUE =>			190,099
ADD IN AMENDMENT RECLAMATION COST			<u>37,917</u>
SURETY AMOUNT – ENTIRE OPERATION (1991-\$)			228,016
ROUNDED AMOUNT-ENTIRE OPERATION (1991-\$)			\$228,000

Reclamation Estimate for Great Salt Lake Minerals & Chemicals Corporation
 Little Mountain Plant Weber County M/057/002

Prepared By Utah State Division of Oil, Gas and Mining
 August 4, 1989

Description	Quantity	Unit	\$/Unit	Cost (\$)
Plant Site Reclamation (a)				
Remove Trash		Lump Sum		20,000
Subtotal				20,000
Brine Supply and Pond System Reclamation (b)				
Remove Wood Structures and Pump Equipment		Lump Sum		60,000
Breach Key Dikes	10	Each	1,200	12,000
Subtotal				72,000
Borrow Pit Reclamation (c)				
Install Fenceline Above Highwall	200	Linear Feet	15	3,000
Regrade for Uniformity	140	Acres	180	25,200
Revegetate	140	Acres	350	49,000
Subtotal				74,200
Totals				166,200
Add Contingency (10%)				16,620
TOTAL RECLAMATION COST (1989 Dollars)				182,820
TOTAL RECLAMATION COST (1994 Dollars) @ 1.93% Annual Inflation				201,000

Notes:

- (a) The plant site is located in an industrial complex that is suitable for various post-mine uses. Reclamation is limited to general cleanup at the 500 acre plant site.
- (b) Due to the wave action of the Great Salt Lake, the dikes will only require breaching in appropriate locations to allow faster dilution of captive salts. The dikes will eventually be leveled by this wave action.
- (c) GSLM extracts approximately 50,000 to 100,000 cubic yards of sand and gravel annually from borrow areas to maintain existing dikes. These borrow pits will be regraded and seeded. One of the pits has a steep highwall that will require fencing.

Reclamation Estimate for Great Salt Lake Minerals & Chemicals Corporation
 Little Mountain Plant Weber County M/057/002

Prepared By Utah State Division of Oil, Gas and Mining
 August 4, 1989

Cost Parameters Used

D-8 Dozer (O&O)	160	\$/hour
988B Wheel Loader (O&O)	165	\$/hour
Labor Only	24	\$/hour
Farm Tractor (O&O)	67	\$/hour
Speed	4	mph
Width of Pass	6	feet

Revegetation Cost per Acre	Quantity	Unit	\$/Unit	Total Cost (\$)
Bare Costs				
Fertilizer (18-46-0)	100	Pounds	0.20	20
Seed Mix	12	Pounds	7	88
Native Hay Mulch	2	Tons	50	100
Seed Mix (drilled)	0.5	Hours	24	12
Subtotal				220
Application Costs				
Native Hay Mulch (spread by hand)	3.0	Hours	24	72
Native Hay Mulch (disc into ground)	0.3	Hours	67	23
Fertilizer (broadcast by hand)	0.5	Hours	24	12
Seed Mix (drilled)	0.5	Hours	0	0
Scarify (tractor with chain)	0.3	Hours	67	23
Subtotal				130
Total Revegetation Cost per Acre				350